

Application No. 10/502,083  
Amendment dated June 5, 2006  
Reply to Office Action of February 3, 2006

Docket No.: 12810-00046-US

### AMENDMENTS TO THE CLAIMS

#### Listing of Claims:

1. (Cancelled)
2. (Currently amended) An isolated nucleic acid ~~comprising a nucleotide sequence~~ encoding a polypeptide that elongates C<sub>16</sub>- or C<sub>18</sub>-fatty acids with at least two double bonds in the fatty acid ~~molecule~~ by at least two carbon atoms, wherein C<sub>18:3</sub><sup>Δ5,9,12</sup>, C<sub>20:3</sub><sup>Δ5,8,11,14</sup>, C<sub>20:4</sub><sup>Δ5,8,11,14</sup> and C<sub>20:5</sub><sup>Δ5,8,11,14,17</sup> are not elongated and wherein said nucleotide sequence is selected from the group consisting of:
  - a) the sequence of SEQ ID NO:1;
  - b) a nucleic acid sequence which, in accordance with degeneracy of the genetic code, is derived from the amino acid sequence of SEQ ID NO:2; and
  - c) derivatives of the sequence of SEQ ID NO:1 which encode polypeptides with at least 50% homology with the amino acid sequences of SEQ ID NO:2, wherein the sequence acts as a C<sub>16</sub>- or C<sub>18</sub>-elongase.
3. (Previously presented) The nucleic acid sequence of claim 2, wherein the sequence is derived from an Oomycete.
4. (Previously presented) The nucleic acid sequence of claim 2, wherein the sequence is derived from Phytophthora.
5. (Withdrawn – Currently Amended) An amino acid sequence encoded within the nucleic acid of claim ~~1~~ 2.
6. (Currently amended) A gene construct comprising the nucleic acid of claim ~~1~~ 2, wherein the nucleic acid is functionally linked to one or more regulatory signals.

Application No. 10/502,083  
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Docket No.: 12810-00046-US

7. (Previously presented) The gene construct of claim 6, wherein the one or more regulatory signals enhance gene expression.
8. (Previously presented) A vector comprising the gene construct of claim 6.
9. (Currently amended) An organism comprising a recombinant nucleic acid that encodes a polypeptide, which elongates C<sub>16</sub>- or C<sub>18</sub>-fatty acids with at least two double bonds in the fatty acid by at least two carbon atoms, wherein one or more of C<sub>18:3</sub><sup>Δ5,9,12</sup>, C<sub>20:3</sub><sup>Δ8,11,14</sup>, C<sub>20:4</sub><sup>Δ5,8,11,14</sup> and C<sub>20:5</sub><sup>Δ5,8,11,14,17</sup> C<sub>20:5</sub><sup>Δ5,8,11,14,17</sup> are not elongated and wherein said nucleotide sequence is selected from the group consisting of:
  - a) the sequence of SEQ ID NO:1;
  - b) a nucleic acid sequence which, in accordance with degeneracy of the genetic code, is derived from the amino acid sequence of SEQ ID NO:2; and
  - c) derivatives of the sequence of SEQ ID NO:1 which encode polypeptides with at least 50% homology with the amino acid sequences of SEQ ID NO:2, wherein the sequence acts as a C<sub>16</sub>- or C<sub>18</sub>-elongase.
10. (Previously presented) The organism of claim 9, wherein the organism is a microorganism, a nonhuman animal or a plant.
11. (Previously presented) The organism of claim 9, wherein the organism is a transgenic plant.
12. (Withdrawn) A process for the production of PUFAs, which comprises culturing the organism of claim 9, under conditions in which said PUFAs are formed in the organism.
13. (Withdrawn) The process of claim 12, wherein the PUFAs prepared by the process are C<sub>20</sub>- or C<sub>22</sub>-fatty acid molecules with at least two double bonds in the fatty acid molecule.

Application No. 10/502,083  
Amendment dated June 5, 2006  
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Docket No.: 12810-00046-US

14. (Withdrawn) The process of claim 13, wherein the C<sub>20</sub>- or C<sub>22</sub>-fatty acid molecules are isolated from the organism in the form of an oil, a lipid or a free fatty acid.
15. (Withdrawn) The process of claim 12, wherein the organism is a microorganism, a nonhuman animal or a plant.
16. (Withdrawn) The process of claim 12, wherein the organism is a transgenic plant.
17. (Withdrawn) The process of claim 12, wherein the C<sub>16</sub>- or C<sub>18</sub>-fatty acid is a fatty acid with three double bonds in the molecule.
18. (Withdrawn) An oil, or lipid or fatty acid or a fraction thereof, prepared by the process of claim 12.
19. (Withdrawn - Currently amended) An oil, lipid or fatty acid composition which comprises PUFAs and is derived from a transgenic plant of claim 11.
20. (Withdrawn) The oil, lipid or fatty acid composition of claim 19, wherein the transgenic plant contains a nucleotide sequence encoding a polypeptide that elongates C<sub>16</sub>- or C<sub>18</sub>-fatty acids with at least two double bonds in the fatty acid molecule, wherein said nucleotide sequence is selected from the group consisting of:  
the sequence of SEQ ID NO:1;  
a nucleic acid sequence which, in accordance with degeneracy of the genetic code, is derived from the amino acid sequence of SEQ ID NO:2; and  
derivatives of the sequence of SEQ ID NO:1 which encode polypeptides with at least 50% homology with the sequence encoding the amino acid sequences of SEQ ID NO:2, the sequence acting as C<sub>16</sub>- or C<sub>18</sub>-elongase.
21. (Withdrawn) Feeding stuffs, foodstuffs, cosmetics or pharmaceuticals comprising the oil, lipid or fatty acid composition of claim 19.

Application No. 10/502,083  
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Docket No.: 12810-00046-US

22. (Currently amended) The nucleic acid of claim 1 2, which encodes a polypeptide that elongates C<sub>16</sub>- or C<sub>18</sub>-fatty acids with at least three double bonds in the fatty acid.
23. (Currently amended) The nucleic acid of claim 1 2, which encodes a polypeptide that elongates C<sub>16</sub>- or C<sub>18</sub>-fatty acids with at least four double bonds in the fatty acid.
24. (Currently amended) The nucleic acid of claim 1 2, wherein the polypeptide shows a preference for elongating C<sub>18:3</sub><sup>Δ6,9,12</sup>, C<sub>18:4</sub><sup>Δ6,9,12,15</sup>, or C<sub>16:3</sub><sup>Δ7,10,13</sup>-fatty acids as compared to one or more of C<sub>18:2</sub><sup>Δ9,12</sup>, C<sub>18:3</sub><sup>Δ4,7,10</sup>, C<sub>18:3</sub><sup>Δ5,8,11</sup>, C<sub>18:3</sub><sup>Δ7,10,13</sup>, C<sub>18:3</sub><sup>Δ8,11,14</sup>, C<sub>18:3</sub><sup>Δ9,12,15</sup> or C<sub>18:3</sub><sup>Δ5,6,9,12</sup>-fatty acids.
25. (Previously presented) The nucleic acid of claim 24, wherein the preference is at least a factor of 1.5.